The Effect of Treated Acquired Syphilis on Life Expectancy

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This study compares the mortality in a general population with the mortality in that portion of the same population which was known to be infected with syphilis. The area from which the population was drawn includes 11 counties in Virginia (Albemarle, Buckingham, Cumberland, Culpeper, Fluvanna, Greene, Louisa, Madison, Nelson, Orange, and Spotsylvania) and the city of Charlottesville.

These localities constitute a rural mountain area, which, by reason of its isolation, normally has a very stable population. There is the further advantage that practically all of the population of this area at some time obtains its medical care at the University of Virginia Hospital in Charlottesville, where routine blood tests have been made on all admissions since the early 1920's. In addition, an intensive case-finding, treatment, and follow-up program has been in effect since that time throughout the area.

Mortality data for the general population were supplied by the Bureau of Vital Statistics of the Virginia State Department of Health, which furnished tabulations of the number of deaths by age, race, and sex reported each year from 1927 through 1943. The populations were obtained from the 1930 census, since data were not available by age, race, and sex for each county in the 1920 census tabulations.

Data concerning the syphilitic portion of the population were obtained from the Department of Dermatology and Syphilology of the University of Virginia Hospital. They consist of observations made on patients 15 years of age or older with acquired syphilis admitted to that institution during the years 1920 through 1941. Both clinic and private patient records were used, so that the syphilitic population was not selected on the basis of ability to pay, thus reducing the economic and sociologic bias.

From 1920 through 1941 there were admitted to the University Hospital 2,908 patients from the selected area with acquired syphilis who were 15 years of age or older. Among these, 202 deaths were reported. Table 1 gives the distribution of these patients by race and sex.

TABLE 1.—*Number of syphilitic patients 15 years of age or older, admitted to the University of Virginia Hospital during the period 1920 through 1941, and number of deaths among such patients, by race and sex*

Race and sex	Number of patients admitted	Number of deaths reported
White male	540	48
White female	405	16
Negro male	970	65
Negro female	993	73
Total	2,908	202

The average duration of observation of individuals in the syphilitic population was about 4 years. All cases were observed for at least 1 month, and some few for as long as 20 years. The average years of observation in each race-sex group are given in table 2.

TABLE 2.—*Average length of observation, in years, of syphilis patients admitted to the University of Virginia Hospital, between 1920 and 1941, by race and sex*

Race and sex	Average years of observation
White male	3.79
White female	3.95
Negro male	3.56
Negro female	3.99

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TABLE 4.—*Abridged life tables for white females, selected areas in Virginia, 1930*

Age group	All white females					White females with acquired syphilis				
	Population	Number of deaths	Number surviving to age period out of 100,000 reaching age 15	Average number dying annually in age period out of 1,000 reaching the beginning of the age period	Temporary expectation of life to age 65 of persons surviving to age period	Person-years of observation	Number of deaths	Number surviving to age period out of 100,000 reaching age 15	Average number dying annually in age period out of 1,000 reaching the beginning of the age period	Temporary expectation of life to age 65 of persons surviving to age period
			l_x	$1{,}000q_x$	$\mathring{e}_x$			l_x	$1{,}000q_x$	$\mathring{e}_x$
15–19	5,338	7	100,000	1.1	43.67	66.5	1	100,000	13.9	38.02
20–24	4,191	25	99,885	6.2	38.80	249.8	2	98,601	7.8	33.67
25–29	3,386	19	96,641	5.5	34.95	321.8	3	94,476	9.5	30.01
30–34	2,974	16	91,248	5.3	30.86	277.8	1	91,205	3.2	25.98
35–39	3,019	19	81,546	6.3	26.71	185.8	1	89,703	5.0	21.35
40–44	2,732	13	85,957	4.6	22.43	165.0	3	84,994	18.7	17.37
45–49	2,611	13	87,056	4.7	16.56	152.8	2	76,003	12.8	13.65
50–54	2,412	29	83,741	12.2	12.25	88.3	1	73,353	10.9	9.33
55–59	1,890	23	78,742	11.9	8.11	56.0	1	68,556	17.9	4.77
60–64	1,762	30	73,692	16.3	.....	41.3	1	61,739	23.9	.....

TABLE 5.—*Abridged life table for Negro males, selected areas in Virginia, 1930*

Age group	All Negro males					Negro males with acquired syphilis				
	Population	Number of deaths	Number surviving to age period out of 100,000 reaching age 15	Average number dying annually in age period out of 1,000 reaching the beginning of the age period	Temporary expectation of life to age 75 of persons surviving to age period	Person years of observation	Number of deaths	Number surviving to age period out of 100,000 reaching age 15	Average number dying annually in age period out of 1,000 reaching the beginning of the age period	Temporary expectation of life to age 75 of persons surviving to age period
			l_x	$1{,}000q_x$	$\mathring{e}_x$			l_x	$1{,}000q_x$	$\mathring{e}_x$
15–19	2,936	12	100,000	4.1	39.84	122.0	3	100,000	23.8	35.94
20–24	1,878	11	99,598	5.7	35.13	574.5	7	98,555	11.4	31.58
25–29	1,138	15	95,139	13.6	31.67	732.3	6	94,508	7.4	27.84
30–34	1,003	11	89,230	10.7	28.64	528.0	10	88,908	19.5	24.46
35–39	1,248	15	84,283	12.0	25.20	418.5	7	81,126	16.1	21.61
40–44	1,138	10	80,186	8.0	21.39	321.5	9	72,959	28.2	18.79
45–49	1,195	27	74,872	22.7	17.75	222.5	6	63,240	26.7	16.38
50–54	1,127	30	66,500	25.7	14.72	251.8	6	55,785	23.1	13.31
55–59	797	41	54,965	52.2	12.37	150.8	6	45,644	35.4	9.06
60–64	809	27	43,762	31.7	10.05	100.5	6	38,818	58.5	6.95
65–69	585	28	36,787	45.9	6.58	64.8	6	27,837	88.3	3.84
70–74	327	35	25,425	105.7	3.59	20.8	5	8,935	228.7	2.88

In order to determine whether the differences thus shown are real or merely the expression of chance fluctuation, Chi square tests were made between the crude

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TABLE 6.—*Abridged life tables for Negro females, selected areas in Virginia, 1930*

Age group	All Negro females					Negro females with acquired syphilis				
	Population	Number of deaths	Number surviving to age period out of 100,000 reaching age 15	Average number dying annually in age period out of 1,000 reaching the beginning of the age period	Temporary expectation of life to age 75 of persons surviving to age period	Person years of observation	Number of deaths	Number surviving to age period out of 100,000 reaching age 15	Average number dying annually in age period out of 1,000 reaching the beginning of the age period	Temporary expectation of life to age 75 of persons surviving to age period
			l_x	$1{,}000q_x$	$\mathring{e}_x$			l_x	$1{,}000q_x$	$\mathring{e}_x$
15-19	2,597	11	100,000	4.1	38.11	354.5	4	100,000	10.7	35.33
20-24	1,769	18	96,308	10.5	34.36	829.5	13	89,462	15.6	33.17
25-29	1,200	12	91,675	9.0	31.02	777.8	11	82,760	14.2	30.71
30-34	1,177	16	86,804	13.7	27.64	621.0	3	78,942	3.8	27.10
35-39	1,309	18	81,021	13.5	24.48	503.0	10	74,996	20.3	23.41
40-44	1,202	22	75,200	16.9	21.21	347.8	6	67,756	17.1	20.70
45-49	1,163	23	68,492	19.0	18.09	219.5	2	63,595	7.9	16.93
50-54	1,121	41	59,780	36.8	15.42	189.8	5	58,751	26.9	13.15
55-59	727	19	50,059	24.1	12.75	117.3	2	52,505	15.7	9.48
60-64	713	36	42,913	50.2	9.70	71.8	3	47,607	41.3	5.21
65-69	537	27	33,203	48.2	7.02	18.0	3	28,228	172.9	2.28
70-74	375	30	24,422	78.0	3.85	12.8	2	4,668	134.6	.....

central death rates in the syphilitic and the total populations. By this means it was demonstrated that there were highly significant differences between the two sets of data. The remainder of the analysis serves to define and measure these differences.

The calculated temporary life expectancy of the syphilitic and of the general population of the selected area is presented graphically for each race-sex group in charts 1 through 4. In all of the four groups considered, the life expectancy of the syphilitic population is lower at every age period than that of the general population. As might be expected, the curves tend to meet in the upper age groups, except in the case of the Negro females, where, although the general rule of a lowered life expectancy for syphilities still obtains, the difference is greatest in the upper rather than in the lower age groups. This probably does not indicate a real trend, however, since in this group the Chi squares between the basic mortality rates were not significant.

It is of interest to note that at age 30 the temporary life expectancy of white males with syphilis to age 75 was 5.5 years less than that of the general population at the same age, and that for Negro males to age 75 the decrease due to syphilis was 4.2 years, for white females to age 65, 4.9 years. Among Negro females to age 75 there was little difference, the loss being only one-half year. This latter is the group for which the general death rates showed no significant difference from those among the syphilitic population.

It must be remembered that the syphilitic population under investigation is a treated population. In fact, due to the intensive control program carried on at the University of Virginia Hospital over a long period of time, this group of syphilitic patients has probably received more therapy than would be true of a comparable group elsewhere. Since no untreated control group is available, the effect of treatment as a factor in lowered life expectancy cannot be estimated. It would appear from the present data, however, that the average life span of persons under routine therapy for syphilis is shorter than that of the uninfected persons.

CHART 1.—*Temporary expectation of life for white males, selected areas in Virginia, 1930*

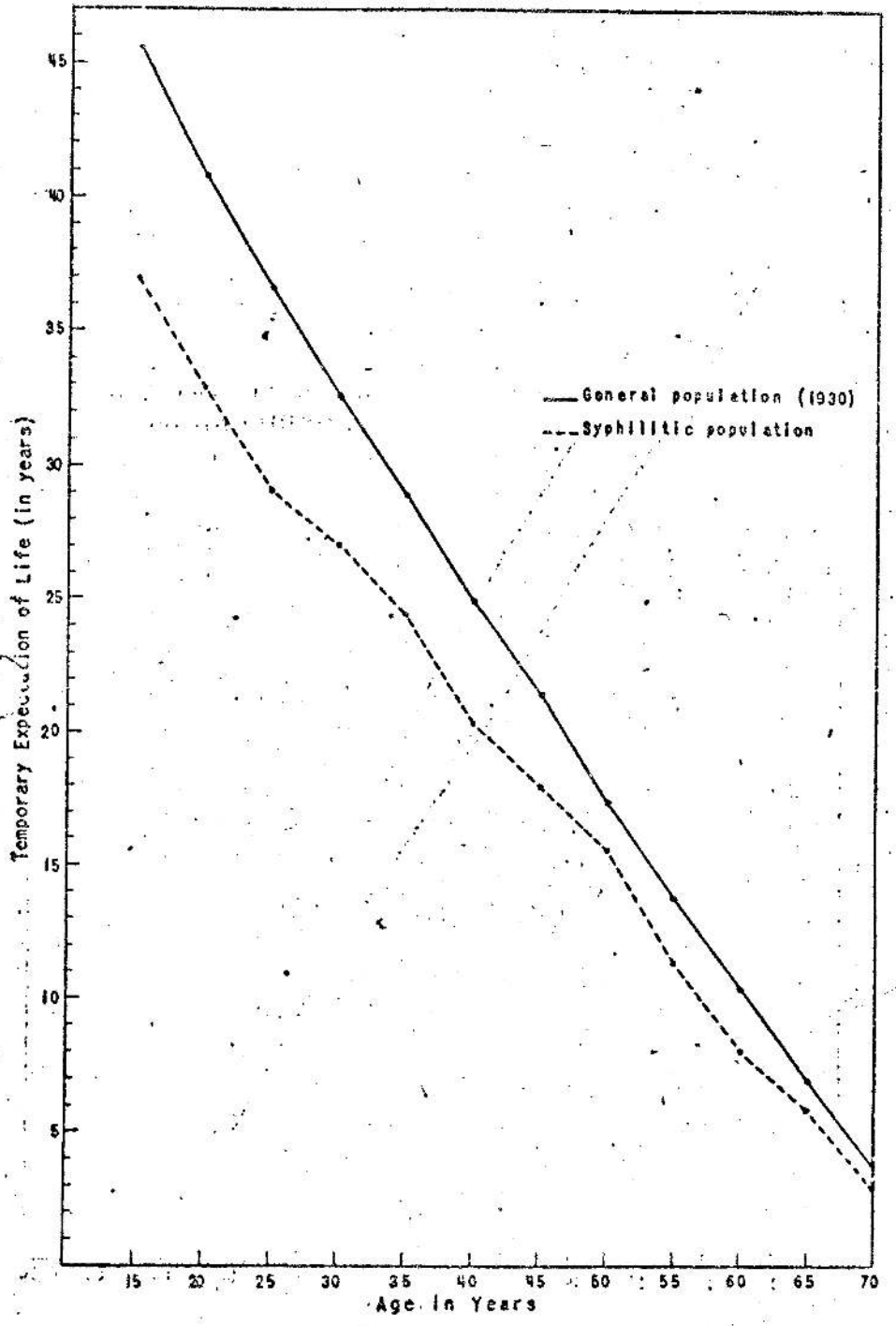

CHART 2.—*Temporary expectation of life for white females, selected areas in Virginia, 1930*

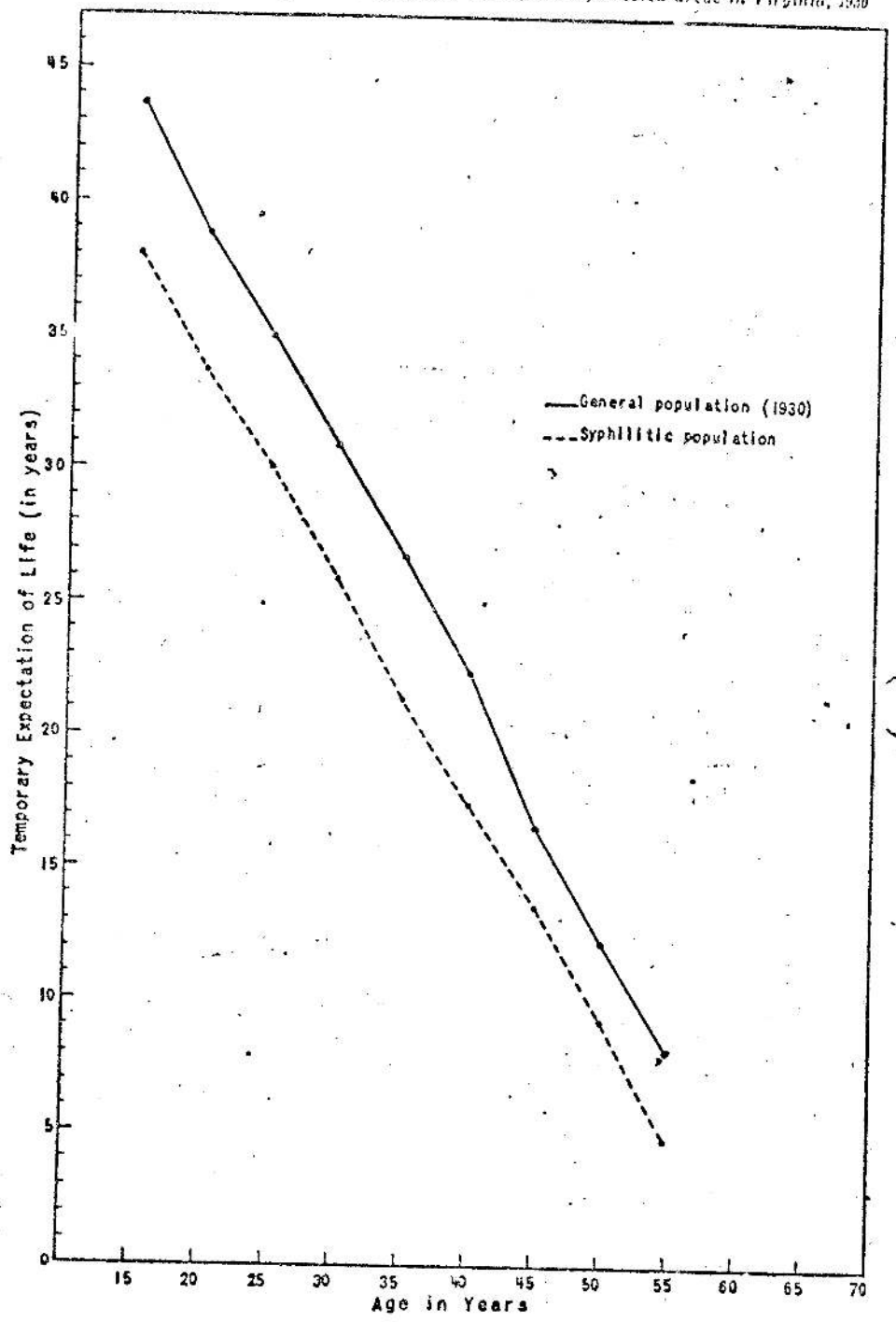

CHART 3.—*Temporary expectation of life for Negro males, selected areas in Virginia, 1930*

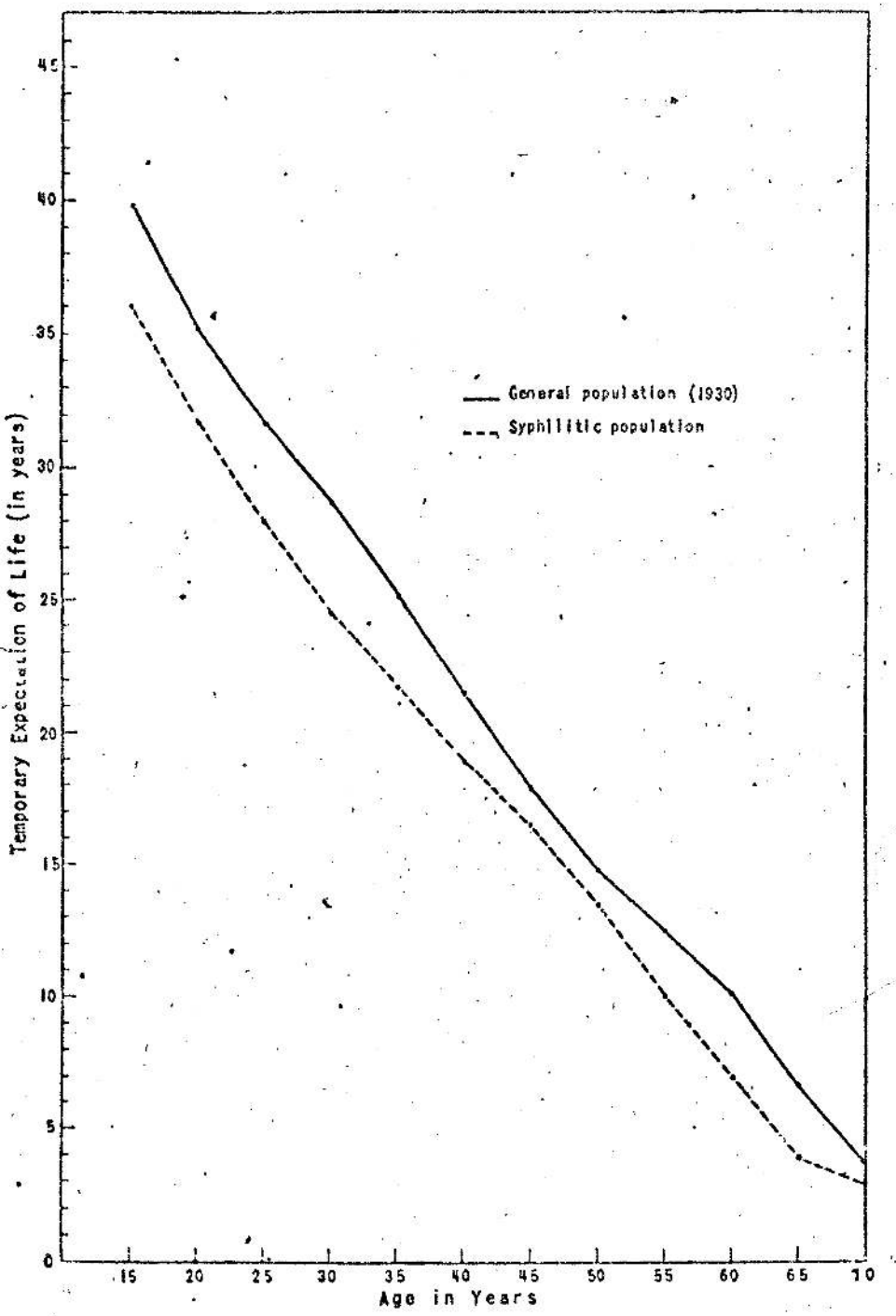

CHART 4.—*Temporary expectation of life for Negro females, selected areas in Virginia, 1930*